

2004 GALVESTON BAY INVASIVE SPECIES RISK ASSESSMENT
INVASIVE SPECIES SUMMARY

Created by: Environmental Institute of Houston, University of Houston-Clear Lake
and the Houston Advanced Research Center

Common Name: Alligatorweed
Latin Name: <i>Alternanthera philoxeroides</i>
Category: Aquatic Plant
Place of Origin: Native to South America
States Effected: Alabama, Arkansas, California, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, Texas, Virginia. http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=ALPH (Accessed 10 March 2003).
Life History: “The stems form dense, tangled masses in the water or occasionally on shore. These stems may be up to 1 m long and 0.8 mm thick. Plants reproduce by stem fragments or seeds.” http://www.wes.army.mil/el/pmis/plants/html/alternan.html (Accessed 10 March 2003).
Growth/Size: “The stems form dense, tangled masses in the water or occasionally on shore. These stems may be up to 1 m long and 0.8 mm thick. Plants reproduce by stem fragments or seeds.” http://www.wes.army.mil/el/pmis/plants/html/alternan.html (Accessed 10 March 2003).
Habitat: “Rooted in shallow submersed habitats to moist soil sites; may form floating mats.” http://www.apms.org/plants/alligatorweed.htm (Accessed 10 March 2003). “Typically, plants grow rooted in soil in shallow water and form dense, interwoven floating mats that extend over the surface of deeper water. Mats can become dense enough to support the weight of a person. Floating mats can break away and colonize new sites. Mats disrupt the natural ecology of a site by reducing light penetration and crowding out native species. Serious infestations can create anoxic, disease, and mosquito breeding conditions.”... “Shallow water or wet soils, ditches, marshes, edges of ponds and slow-moving watercourses. Tolerates saline conditions (to 10% salt by volume). Requires a warm summer growing season. Tolerates cold winters, but cannot survive prolonged freezing temperatures.” http://pi.cdfa.ca.gov/weedinfo/ALTERNAN2.htm (Accessed 10 March 2003). “Fresh water bodies, preferably still. Also spreads over adjacent moist ground to some distance from the water’s edge. Can tolerate a degree of salinity, and total immersion for periods of a few days.” - http://www.esc.nsw.gov.au/weeds/Sheets/aquatic/A%20Alligator%20weed.htm (Accessed 10 March 2003).
Attitude (aggressive, etc.): “Major nuisance to subtropical aquatic sites and wetland areas, especially ditch and stream habitats.” http://www.apms.org/plants/alligatorweed.htm (Accessed 10 March 2003). “Reproduces vegetatively from stolons. Each node or fragment with a node is capable of producing a new plant. Plants are highly competitive and have rapid growth rates. Plants rarely grow in water deeper than 2 m. Seeds rarely develop, and those that do are seldom viable.” http://pi.cdfa.ca.gov/weedinfo/ALTERNAN2.htm (Accessed 10 March 2003). “Alligator weed can blanket the water surface reducing light levels, temperature and oxygen in the water below. This has profound effects on communities of native plants and animals in the water. It also interferes with animal access for drinking water, human access for swimming and boating, reduces water quality and blocks pumps.” - http://www.esc.nsw.gov.au/weeds/Sheets/aquatic/A%20Alligator%20weed.htm (Accessed 10 March 2003).
Physical Description: “Immersed or submersed perennial, leaves opposite and simple, flowering head of small white flowers borne in axils.” http://www.apms.org/plants/alligatorweed.htm (Accessed 10 March 2003).

“GENERAL DESCRIPTION: Noxious herbaceous aquatic to terrestrial perennial, with horizontal to ascending stems 1 m long that root at the nodes. Aquatic form has hollow, floating, emergent and submerged stems. Terrestrial plants have solid stems.”

“SEEDLINGS: Seedlings seldom encountered because viable seed is rarely produced.”

“MATURE PLANT: Stems simple or branched and lacking hairs or with 2 opposing lengthwise rows of hairs. Leaves opposite, more or less equal at a node, sessile or with narrowly winged petioles (to 1 cm long) that clasp the stem. Leaf blades mostly 4-11 cm long, 1-3 cm wide, narrowly lanceolate (to obovate), with entire margins and a smooth waxy surface.”

“ROOTS and UNDERGROUND STRUCTURES: Stolons root at the nodes. Floating plants have shorter, finer roots than plants rooted in soil. Stolon fragments with a node often develop into new plants.”

“FLOWERS: June-October. Pleasantly fragrant. Spikes head-like, 12-18 mm in diameter on terminal or axillary stalks 4-9 cm long. Flowers and bracts pearly white, glabrous. Flowers lack petals. Sepals 5, separate 5-7 mm long. Stamens 5, opposite sepals, and alternate with 5 longer sterile stamens (staminodia). Ovary superior, with a single chamber containing 1 ovule.”

“FRUITS and SEEDS: Utricles membranous, do not open to release the single seed. Seeds smooth, disc-shaped to flattened wedge-shaped. Mature fruits seldom encountered.”

<http://pi.cdfa.ca.gov/weedinfo/ALTERNAN2.htm> (Accessed 10 March 2003).

“A large perennial herb which is rooted at the water’s edge and spreads out as a floating mat over the water surface, and over the adjacent moist ground as well. Mats may be up to 1m thick. Stems are spreading, hollow and may be green, yellow or red. Leaves are in opposite pairs, narrow (2-7cm long x 4-40mm wide), slightly fleshy and with a waxy surface. Flowers are tiny, white, papery and in spherical heads about 1cm in diameter, on 2-6cm stalks in the leaf axils.” -

<http://www.esc.nsw.gov.au/weeds/Sheets/aquatic/A%20Alligator%20weed.htm> (Accessed 10 March 2003).

“Plants are perennial with stems usually bent toward the bottom and rooting at the nodes. The stems are glabrous except for a narrow band of hairs within the leaf bases. The stems become hollow and slightly flattened with age, often pink when fresh. The leaves are opposite, simple, sessile, usually thick and fleshy, linear-elliptic, to 9 cm long and 1.5 cm wide, apices acute, tipped with a tiny spine, tapering to the base to clasp the stem. One leaf joins with the opposite leaf to form a narrow sheath. The inflorescence is a several-flowered, whitish head on a stalk. Petals are lacking, the sepals are whitish.”

<http://www.wes.army.mil/el/pm/s/plants/html/alternan.html> (Accessed 10 March 2003).

Management Recommendations / Control Strategies: include references for existing site-specific strategies

“Introduced from South America. The alligatorweed flea beetle (*Agasicles hygrophila*), stem borer moth (*Vogtia malloi*), and alligatorweed thrips (*Amynothrips andersoni*) have been released as biocontrol agents in the Southeastern U.S. These insects can effectively control infestations of alligatorweed. <http://pi.cdfa.ca.gov/weedinfo/ALTERNAN2.htm> (Accessed 10 March 2003).

CONTROL METHODS:

Prevention: *A. philoxeroides* generally will not establish in water deeper than 2 meters. Proper pond construction can minimize shallow edges and prevent establishment. Likewise, establishment of competitive grasses or other native species on the banks of ponds and irrigation ditches will reduce soil erosion and prevent *A. philoxeroides* from gaining a terrestrial foothold.

Mechanical: Since this plant will regenerate from rootstocks and fragmented stems, removal of the dense floating mats will only provide temporary control. Care must be taken to prevent transport of detached stems downwater, where re-establishment can rapidly occur. Tillage of terrestrial plants may sever roots and shoots, which may increase the spread of the plant.

Biological: There have been three South American insect species released between 1964 and 1971 to control *A. philoxeroides*, with varying degrees of success. The alligatorweed flea beetle *Agasicles hygrophila* may cause considerable damage to aquatic mats of *A. philoxeroides*. It feeds on the leaves and bores into stems, where it pupates before adulthood. Unfortunately, it will neither feed upon nor reproduce in terrestrial plants. Considerable success has been shown in the southeastern United States. However, repeated attempts at establishment in California during 1967-1969 met with little success and no further colonizations were attempted. The alligatorweed stem borer *Vogtia malloi* is a small moth which lays eggs on the apical leaves. The larvae bore into the stem tips and

move down the stems. Infested stems rapidly wilt and droop. This damage can be easily distinguished from the flea beetle's characteristic leaf stripping of plants. The insects were initially released in Florida, Georgia, the Carolinas and Alabama from 1971 to 1973, and have since been reported in Arkansas, Louisiana, Mississippi, and Texas. A thrips species, *Amynothrips andersoni*, attacks and deforms apical leaves of both aquatic and terrestrial plants. Damage, however is relatively minor and scattered. Attempts to establish this species from 1967 to 1971 in Albany, California were unsuccessful. Most adults are wingless and dispersal is somewhat limited.

Chemical: The following herbicide treatments have demonstrated considerable success, although pretreatment is necessary.

- 1) 2,4-D at 8 lb/A mixed with 8 oz of detergent applied in 50 gallons of water per surface acre.
 - 2) Glyphosate (Rodeo) at 6 pints per acre + X-77 non ionic surfactant at 3 pints per acre applied in 50 gallons of water per surface acre.
 - 3) Dicamba (Banvel 720) at 1 gallon + Rodeo at 1 quart + X-77 at 1 pint applied in 50 gallons of water over plants.
- Read and follow all label directions before applying any herbicide to water. Misuse may cause extensive damage to other nontarget plants, both native and agricultural.

<http://pi.cdfa.ca.gov/weedinfo/ALTERNAN2.htm> (Accessed 10 March 2003).

“Because of the ease of breaking plants up and spreading them during mechanical removal, herbicide is the preferred method of control, but a permit will be required from the Environmental Protection Agency to apply any herbicide to a water body. Only a limited number of herbicides are registered for use over water. If you suspect you have an outbreak of an aquatic weed, notify your local weed control authority (usually Council) and take their advice on control methods.”

<http://www.esc.nsw.gov.au/weeds/Sheets/aquatic/A%20Alligator%20weed.htm> (Accessed 10 March 2003).

“This species often clogs areas in which it grows. Biological control of this species with insects has been spectacularly successful; in 1963 there were over 38,800 problem hectares in the U.S., but in 1981 there were less than 400 ha. All states, except North Carolina, now rely on this method to keep populations at acceptable levels.”

<http://www.wes.army.mil/el/pmis/plants/html/alternan.html> (Accessed 10 March 2003).

“The primary method now used for control of alligatorweed in Texas is biological control with alligatorweed flea beetle. In 1963, there were 97,000 problem acres of alligatorweed in the United States, however, by 1981 there was less than 1,000 problem acres. This change is primarily due to biological control with the alligatorweed flea beetle. Although periodic problems do arise, little herbicide control is needed for control of alligatorweed today, due to the control provided by *Agasicles hygrophila*.”

Biological Control Agents

- [Alligatorweed flea beetle, *Agasicles hygrophila*](#)
- [Alligatorweed thrips, *Amynothrips andersoni*](#)
- [Alligatorweed stem borer, *Vogtia malloi*](#)

<http://bc4weeds.tamu.edu/alligatorweed.html> (Accessed 10 March 2003).

References (includes journals, agency/university reports, and internet links):

1. APMS - <http://www.apms.org/plants/alligatorweed.htm>
2. CDFA - <http://pi.cdfa.ca.gov/weedinfo/ALTERNAN2.htm>
3. ESC - <http://www.esc.nsw.gov.au/weeds/Sheets/aquatic/A%20Alligator%20weed.htm>
4. STPL - <http://www.wes.army.mil/el/pmis/plants/html/alternan.html>
5. PLANTS - http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=ALPH
6. TAMU - <http://bc4weeds.tamu.edu/alligatorweed.html>

Other Links listed on TAMU:

- [Alligatorweed](#)
- [Invasive Alien Plant Species of Virginia: Alligatorweed](#)
- [Biological Control Insects For Aquatic and Wetland Weeds: Alligatorweed](#)
- [Biological Control with Insects: The Alligatorweed Thrips](#)

Available Mapping Information:

STPL - <http://www.wes.army.mil/el/pmis/plants/html/alternan.html>

PLANTS - http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=ALPH